

REMARKS

Claims 11, 14-15, 17-20, 24 and 28-30 have been rejected under 35 USC 103(a) as unpatentable over Yee in view of Hui. The rejection is respectfully traversed.

In Applicants' claimed invention, a data signal is modulated directly onto an optical carrier resulting in small spectra where the optical carrier lies within the data spectrum. Two of these modulated signals are filtered to generate a single sideband signal (or the single sidebands signals are generated in another way). The two single sidebands having orthogonal polarization are combined. The claimed invention combines two sideband modulated signals with overlapping spectra into the polarization multiplex signal with overlapping orthogonal spectra including both optical carriers. The advantage is that the spectral efficiency is improved, because the bandwidth needed is reduced according to the differential frequency. If the spectra overlap totally the bandwidth for the transmission of two sideband modulated signal corresponds to the bandwidth of only one single sideband modulated signal (or one subband signal).

The difference between the spectrum of Applicants' claimed invention and Yee's spectrum is clear from the figures. (See e.g. the spectra shown in Applicants' Figures 2A (same carrier frequencies) and 2D (different carrier frequencies) compared with the spectra shown in Yee FIG 16.) The spectra of Yee do not overlap.

In contrast to Applicants' claimed invention, Yee modulates two data signals onto a tone generating two (single sideband) subbands with a common subcarrier or tone. Yee then modulates the subbands with the tone onto an optical carrier. This leads to spectra 1660A, 1660B shown in FIG 16. These spectra are then combined and filtered. The result is a spectrum 1690 shown in FIG 16 or shown in FIG 20B. According to Yee, column 19, lines 57 - 64 FIG 19 and 20A illustrate another example of the optical transmitters 1610A and 1610B shown in FIG 16. According to FIG 19 and FIG 20A, a plurality of subband signals is transmitted. This is also confirmed from the description of FIG 16, column 19, lines 18 - 20: "the upper optical sideband 1668A(U) of one signal is adjacent to the lower sideband 1668B(A) of the other signal.

In addition, the spectrum of the generated composite signal (polarization multiplex signal) is shown in FIG 20B (Yee, column 24, lines 30 - 56). There is, "a 4 GHz guard space between the two groups" (See, e.g., see FIG 20B and column 24, line 41, 42). Thus, the single sideband signals in Yee do not overlap. Indeed, in Yee the whole spectrum is wider - 44 GHz -

than two groups of single sideband signals (column 44, line 43). The spectrum also is wider because the optical carriers are each offset by 20 GHz (column 24, lines 44, 45) so that the whole bandwidth becomes 84 GHz (column 24, line 45). This is due to the subcarrier modulation onto the tones. The same method is applied to the tones 1668A, 1668B and the optical carriers in FIG 16.

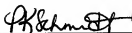
Therefore the Examiner incorrectly states that Figures 19 and 20 "pertain to an entirely different embodiment" (Final Office Action, Response to Arguments, p. 6).

The Examiner also notes that Yee fails to teach that dependent on the analyzing result, deriving at least one control signal for the purpose of controlling the polarization control element but that Hui teaches this concept. However, there is no reason why the skilled artisan would have been motivated to analyze the result and derive at least one control signal for the purpose of controlling the polarization control element in order to indicate the two principal states of polarization. While Hui discloses the well known combination of a polarization controller and a polarization beam splitter, it would not make any sense to combine Hui with Yee and to use these expensive elements which are not necessary.

In view of the above, Applicants submit that the claims are in condition for allowance . An indication of the same is solicited. The Commissioner is hereby authorized to charge deposit account 02-1818 for any fees which are due and owing, referencing Attorney Docket No. 119010-054.

Respectfully submitted,

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